Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Cyclosporine therapy during the COVID-19 pandemic

To the Editor: The rapid dissemination of the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and COVID-19 pandemic raised concerns related to possible risks associated with the immunosuppressive treatment of autoimmune diseases.[1,2] Cyclosporine is an immunosuppressive drug that acts selectively on T cells by inhibiting calcineurin phosphorylase. It is widely used in dermatology, rheumatology, nephrology, ophthalmology, and transplantation.

Despite its immunosuppressive activity, infections are not a common adverse effect.[3] Some reports of severe infections in patients treated with cyclosporine have been published, but several data sources indicate that the risk of common infections in patients receiving cyclosporine is low[3] and comparable to that in individuals receiving placebo. In a study of 225 patients receiving cyclosporine for 12 months, none of the patients experienced the reactivation or a new onset of viral infections, including varicella zoster virus, herpes simplex 1, herpes simplex 2, Ebstein-Barr, cytomegalovirus, and HIV, or other infectious diseases.[3] It was suggested that cyclosporine may exert a therapeutic effect in patients with selected viral diseases.

Numerous in vitro data also indicate that cyclosporine has wide-spectrum antiviral properties. It inhibits the replication of viruses such as the hepatitis B virus, hepatitis C virus, and HIV virus.[4] Cyclosporine also inhibits the replication of influenza A virus, West Nile virus, Rift Valley fever virus, and Zika virus through blocking the interaction of cellular cyclophilins with viral proteins and inhibiting viral RNA synthesis.[4]

The effect of cyclosporine on coronaviruses, other than the new SARS-CoV2, has been extensively studied. The attention was especially paid to 2 life-threatening coronaviruses in humans, SARS-CoV and Middle East respiratory syndrome-related coronavirus (MERS-CoV). The data showed that cyclosporine reduced MERS-CoV and SARS-COV replication in vitro.[5] A similar inhibiting effect was observed in case of other coronaviruses, including human coronavirus 229E, transmissible gastroenteritis coronavirus, feline coronavirus, porcine epidemic diarrhea virus, and mouse hepatitis virus.[5] Promising in vitro results led some authors to the speculation that cyclosporin may be an interesting treatment option for SARS.[6]

No literature data are available on the effect of cyclosporine on SARS-CoV2, which causes COVID-19, but available data allow us to hypothesize that patients who receive cyclosporine treatment for dermatologic autoimmune diseases may benefit from its antiviral activity. They are probably at a lower risk of developing severe symptoms related to COVID-19 compared with patients who receive other treatments for their conditions. An open question remains whether the antiviral activity of cyclosporine may impair the development of immunity to coronaviruses and, as a consequence, increase vulnerability to future infections.

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Funding sources: None.

Conflicts of interest: None disclosed.

IRB approval status: Not applicable.

Reprints not available from the authors.

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https://doi.org/10.1016/j.jaad.2020.04.153